



THE SMI ADVANTAGE *for* CALCIUM FORTIFICATION

*SMP's calcium carbonate  
delivers high bioavailability,  
the highest concentration of  
calcium, and is engineered  
to work economically and  
optimally in your application.*



Your Technology Resource®

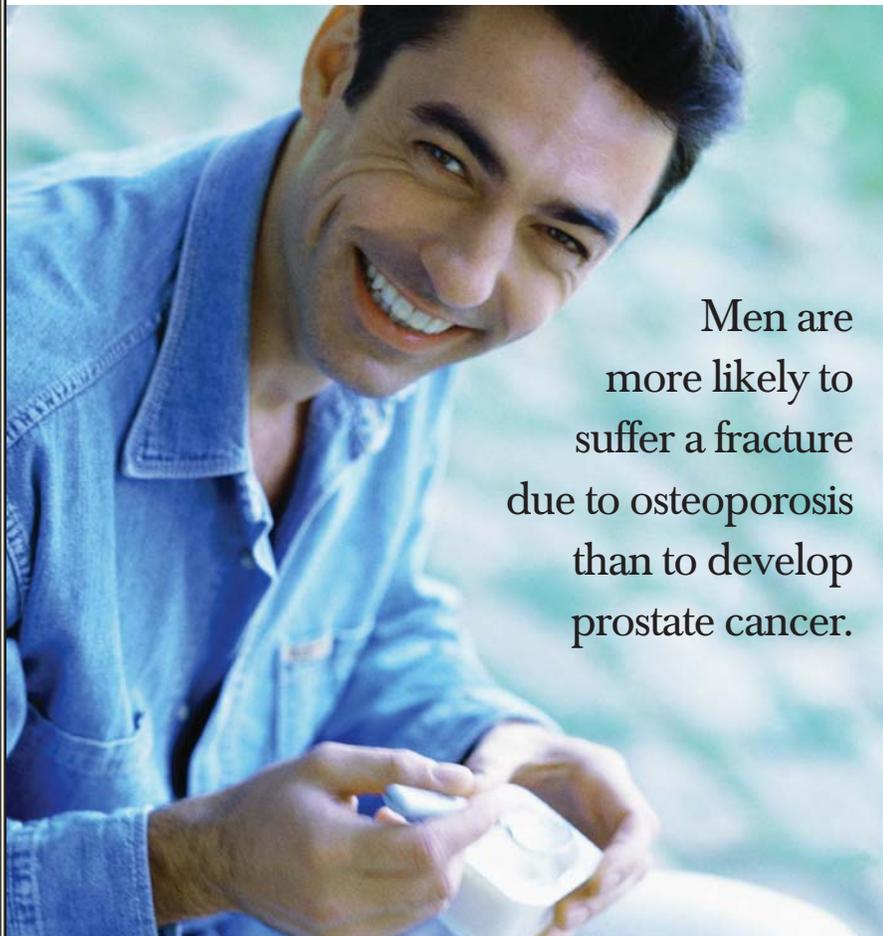
# HOW FRACTIONS LEAD *to* FRACTURES

Most people get only a fraction of the calcium they need. The result is an increased incidence of osteoporosis, a disease characterized by weakened bones and increased risk of fracture. Osteoporosis is second only to cardiovascular disease as a leading health care problem, according to World Health Organization (WHO).

*While 1.7 million hip fractures occurred worldwide in 1990, WHO projects that number to reach 6 million annually by the year 2050. Worldwide, hip fractures are the most costly result of osteoporosis in terms of economics and in terms of lives.*

- 20% of hip fractures are fatal
- 50% result in permanent disability
- Only 30% fully recover

## *Who has Osteoporosis?*



Men are more likely to suffer a fracture due to osteoporosis than to develop prostate cancer.

Worldwide, the lifetime risk for a woman to have an osteoporotic fracture is 30-40%. In men the risk is about 13%.

*In the European Union alone someone suffers an osteoporotic fracture every thirty seconds.*

Even in an advanced country like the United States, according to the National Osteoporosis Foundation, the typical American gets only about 600mg of calcium a day in their diet, about half of what is needed. As a result, osteoporosis affects an estimated 44 million Americans, including 55% of people over the age of 50.



# Osteoporosis

*is a growing global problem*

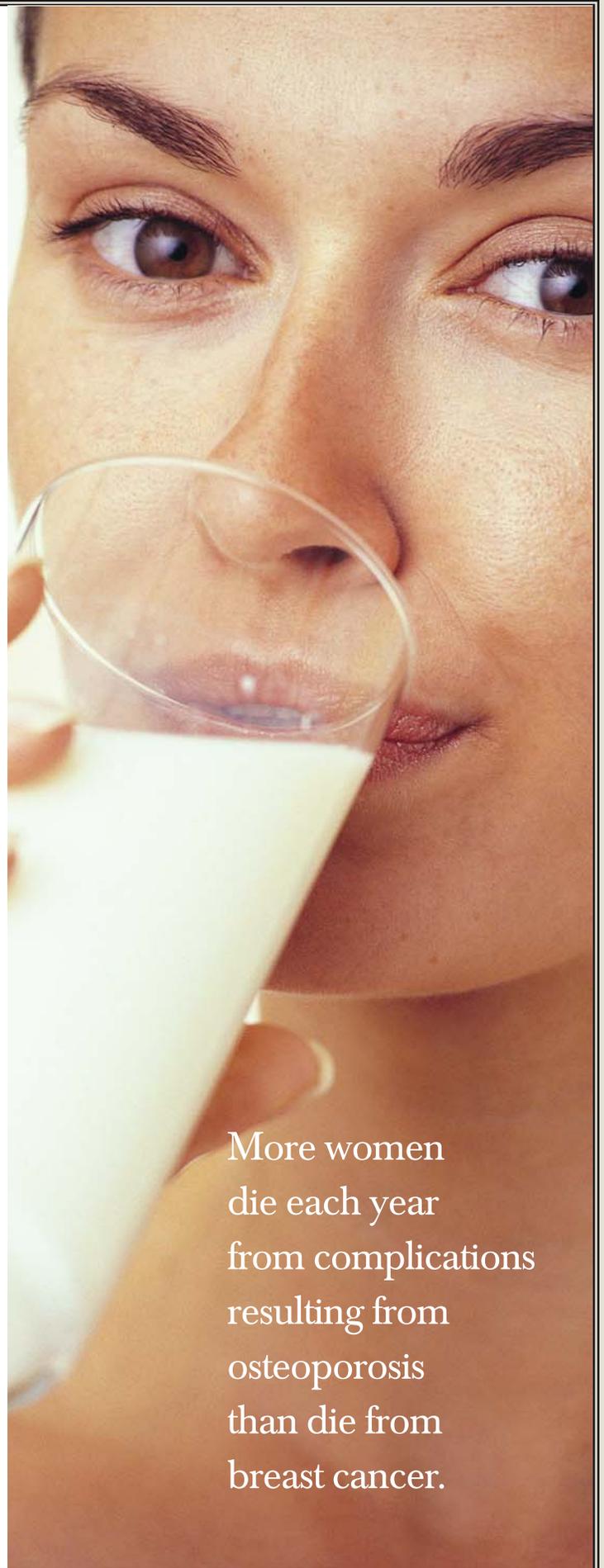
The bone mass that must last a lifetime is built during childhood and the teen years. But the changes in lifestyles and diets from the hectic pace of modern life are resulting in generations of young people who are not getting the right nutrition to build this bone mass. Kids are eating their cereal without milk, and are drinking soda pop instead of milk with meals.

**70%** of children aren't getting enough calcium in their diets to build strong bones.



And for young women, for whom building bone mass is most important, the statistics are worse:

**90%** of girls aged 9 to 17 don't get enough calcium.



More women die each year from complications resulting from osteoporosis than die from breast cancer.

# CALCIUM FORTIFICATION *is* THE ANSWER

Food and nutritional supplement formulators are helping address this major public health problem. A wide variety of great tasting foods are being formulated and sold that contain 10% - 20% of the RDA for calcium. Many of them use calcium carbonate.

## *How much Calcium do consumers need?*

In 1997, the Institute of Medicine of the National Institute of Health issued guidelines on the amount of calcium that should be consumed.

### **Optimal Daily Intake** (in mg of calcium)

#### **Infants**

|                   |     |
|-------------------|-----|
| Birth - 6 months  | 400 |
| 6 months - 1 year | 600 |

#### **Children**

|              |             |
|--------------|-------------|
| 1 - 5 years  | 800         |
| 6 - 10 years | 800 - 1,200 |

#### **Adolescents/Young Adults**

|               |               |
|---------------|---------------|
| 11 - 24 years | 1,200 - 1,500 |
|---------------|---------------|

#### **Men**

|               |       |
|---------------|-------|
| 25 - 65 years | 1,000 |
| Over 65 years | 1,500 |

#### **Women**

|                                |               |
|--------------------------------|---------------|
| 25 - 50 years                  | 1,000         |
| Pregnant and nursing           | 1,200 - 1,500 |
| Over 50 years                  | 1,500         |
| Postmenopausal on estrogen     | 1,000         |
| Postmenopausal not on estrogen | 1,500         |
| Over 65 years                  | 1,500         |

## Calcium Sources

Dairy products are excellent sources of calcium but many consumers restrict their intake of milk, cheese and other products because of lactose intolerance and other dietary considerations.

With increasing public education and awareness of the benefits of calcium in fortified foods, consumers actively seek out non-dairy sources of calcium or fortified dairy sources that deliver more calcium per serving.



*Calcium usage has increased over the past two years*

**40%**

A large, stylized, olive-green arrow graphic that points upwards and to the right, framing the '40%' text. The arrow is thick and has a simple, clean design.



# All Calcium is not created equal

Calcium carbonate is nature's outstanding source of calcium for fortification offering the perfect balance of benefits for today's manufacturers.

- Highest calcium concentration
- High bioavailability
- Economical to purchase
- Economical to use
- Excellent taste in foods



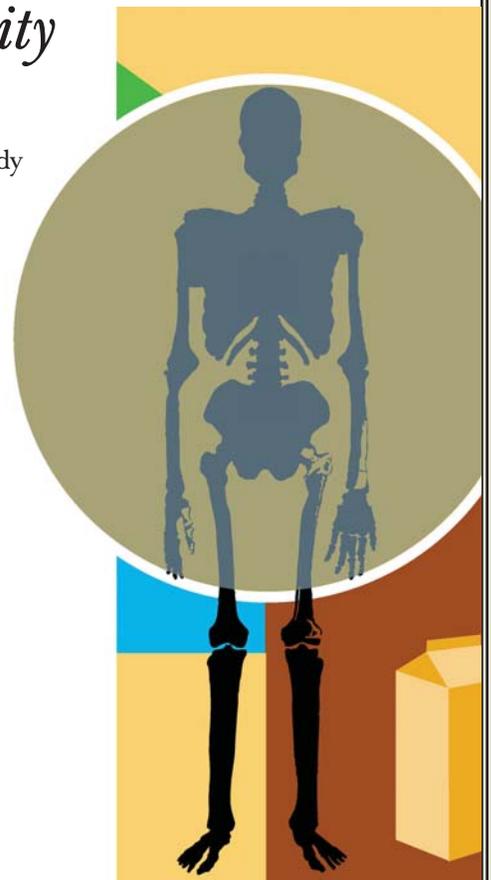
## Highest Calcium Concentration

Calcium carbonate is 40% elemental calcium, while other commonly used sources have as little as 9% elemental calcium.

*It takes only a 1/4 gram of calcium carbonate per serving to qualify as a Good Source of Calcium (10% of the adult RDA) and only 1/2 gram of calcium carbonate per serving to qualify as an excellent source of calcium (20% of the RDA).*

## High Bioavailability

Many studies have shown that calcium carbonate is as readily absorbed by the body as most of the other common sources of calcium, including milk. Little or no difference in bioavailability is found among the calcium carbonate, citrate, gluconate, lactate and phosphate compounds. Calcium carbonate is quickly and completely soluble in the stomach and readily absorbed by the body.



# PROFIT *from* HIGHER VALUES

*P*  
*Product*  
*Weight*  
*Needed*  
*For 1,000mg*  
*Elemental*  
*Calcium*

|                                   | % Calcium     | Grams Needed | Weight vs. CaCO <sub>3</sub> |
|-----------------------------------|---------------|--------------|------------------------------|
| <b>Calcium Carbonate</b>          | <b>40.0 %</b> | <b>2.5</b>   | —                            |
| Tricalcium Phosphate              | 38.0 %        | 2.6          | 1.1 x                        |
| Dicalcium Phosphate Anhydrous     | 29.4 %        | 3.4          | 1.4 x                        |
| Dicalcium Phosphate Dihydrate     | 23.2 %        | 4.3          | 1.7 x                        |
| Calcium Citrate                   | 21.0 %        | 4.8          | 1.9 x                        |
| Monocalcium Phosphate Anhydrous   | 17.1 %        | 5.8          | 2.3 x                        |
| Monocalcium Phosphate Monohydrate | 15.9 %        | 6.3          | 2.5 x                        |
| Calcium Lactate                   | 13.0 %        | 7.7          | 3.1 x                        |
| Calcium Gluconate                 | 8.9 %         | 11.2         | 4.5 x                        |



## *Economical to Purchase*

Calcium carbonate is one of the most inexpensive forms of calcium that is commonly used in foods and nutritional supplements. The prices of even the premium ultra-low lead CalEssence® Precipitated Calcium Carbonates from Specialty Minerals are still less expensive than calcium lactates and gluconates.

## *Economical to Use*

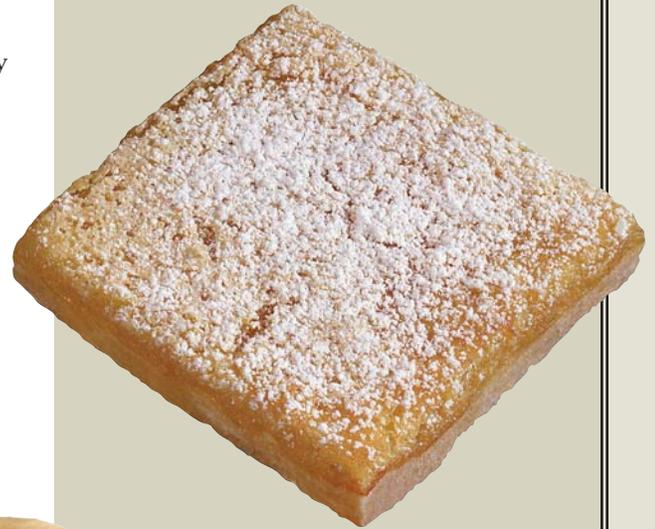
The high calcium content of calcium carbonate minimizes the amount of calcium salt needed, and the low unit purchase price results in an extremely low fortification cost – a fraction of the cost of using other calcium compounds.

## *Good Taste*

Calcium carbonate is the calcium source used in many calcium fortified foods on the market today – cereals, snack bars, waffles, pancakes, graham crackers, snack crackers, chocolate milks, soy milks, adult liquid meals and soft chews. Only a small amount of calcium carbonate is required for fortification, which minimizes any potential effect on taste.

## *It's not just for People Anymore*

Studies show that pets add to our longevity and positive disposition. Calcium fortification works wonders for the animals in our life, providing them with many of the same benefits humans enjoy. Fortified pet foods help ensure our pets enjoy healthy years to share with us.



# PCC - *Beyond* CALCIUM CARBONATE

PCC stands for Precipitated Calcium Carbonate — also known as purified calcium carbonate or refined calcium carbonate. Specialty Minerals Inc. (SMI) is the leading global producer of PCC.

Our PCC process allows SMI to grow crystals of different shapes. Each shape has different physical properties, such as powder density, surface area and oil absorption, which give them outstanding performance in many applications where ground calcium carbonate (GCC) does not perform as well.

These ultrafine PCCs have special applications where high performance is required.



## *Getting Back to the Basics*

*The CalEssence® USP PCC product line meets the low lead standards of Proposition 65. These high purity products are a good source of fortification for food and nutritional applications.*

# PCC & GCC

*SMI offers both high purity GCC and PCC to meet the many needs of the food and beverage industry.*

## *Formulating Flexibility*

Specialty Minerals offers many different calcium carbonate products of varying particle shapes and sizes. The combinations of shape and size result in a wide variety of physical properties, so a formulator can better match the calcium source to the physical and sensory properties desired.

## *High Purity*

Specialty Minerals has three families of calcium carbonates. Purest are the ultra-low lead CalEssence® PCCs with the lowest lead levels available – less than 125 ppb. Next are the ViCALity® PCCs, long the industry standard for quality and purity. They have less than 500 ppb lead. All SMI PCCs meet the requirements for calcium carbonate of the U.S. Pharmacopeia and of the Food Chemicals Codex. They are certified as Kosher and are listed on the organic list.

Food Grade VICRON® ground calcium carbonates, which meet the requirements for Limestone of the Food Chemicals Codex, are also Kosher.

The Sturcal™ and Calopake™ PCCs manufactured at Specialty Minerals Birmingham, England, work exceptionally well in food, beverage and nutritional applications. These products meet both USP and EP requirements.



# SMI CALCIUM CARBONATE PRODUCTS

SMI has PCC and GCC product families to meet almost any application challenge. Our calcium carbonate products are manufactured to meet a host of regulatory specifications including the U.S. Pharmacopeia, the Food Chemical Codex, Kosher certification, California's Proposition 65, and European Pharmacopeia. The range of properties offered by our products ensures success in your formulation.



- Best Product Choice
- Also Useful
- ✓ Consider VICRON® FG Limestone

|  |                      |
|--|----------------------|
| <b>Animal and Pet Kibble</b>   |                      |
| <b>Baked Goods</b> - <i>(Cookies, Crackers, Pancakes, Waffles)</i>       |                      |
| <b>Bars</b> - <i>(Snack, Nutrition, Diet, Fruit, Protein)</i>            |                      |
| <b>Beverages</b> - <i>(Soy Milk)</i>                                     |                      |
| <b>Cereals</b> - <i>(Hot and Cold)</i>                                   | Batter Addition      |
|  | Color or Flavor Bits |
|  | Coating              |
|  | Dry Blend            |
| <b>Drink Mix Powders</b> - <i>(Soy, Diet, Chocolate, Infant Formula)</i> |                      |
| <b>Dry Food Mixes</b>  |                      |
| <b>Flour Enrichment</b>  |                      |
| <b>Frozen Dairy</b> - <i>(Ice Cream, Yogurt)</i>                         |                      |
| <b>Infant Formulas</b>   | Dry Mix              |
|  | Liquid               |
| <b>Pasta Enrichment</b>  |                      |
| <b>Redispersible Powders</b> - <i>(Coffee Creamers)</i>                  |                      |
| <b>Vitamin/Mineral Premixes</b>  |                      |

| CalEssence® PCC |    |     |     |      | ViCALity® PCC |           |             |       |        |       |             | EUROPEAN PCC |            |            |             |                       | GCC                          |
|-----------------|----|-----|-----|------|---------------|-----------|-------------|-------|--------|-------|-------------|--------------|------------|------------|-------------|-----------------------|------------------------------|
| 70              | 80 | 300 | 450 | 1500 | ALBAFIL®      | ALBAGLOS® | Extra Light | Light | Medium | Heavy | Extra Heavy | Sturcal™ F   | Sturcal™ H | Sturcal™ L | Calofort™ U | Calopake™ Extra Light | VICRON® Food Grade Limestone |
|                 |    |     |     |      | ■             |           |             |       |        | ●     | ●           |              |            | ●          |             |                       | ✓                            |
|                 |    | ●   | ●   |      |               |           |             |       |        | ●     | ●           |              |            | ●          |             |                       | ✓                            |
|                 |    | ●   | ●   |      |               |           |             |       |        | ●     | ●           |              |            | ●          |             |                       | ✓                            |
| ●               | ■  |     |     |      | ●             | ■         | ■           |       |        |       |             | ●            |            |            | ●           | ■                     |                              |
| ■               |    | ●   | ●   |      | ■             |           |             |       |        |       | ●           |              |            |            |             | ■                     |                              |
| ■               |    | ●   | ●   |      | ■             |           | ●           |       |        | ●     | ●           |              |            |            |             |                       | ✓                            |
| ●               |    | ●   | ●   |      | ●             |           |             |       |        | ●     | ●           |              |            | ●          |             |                       | ✓                            |
| ■               |    | ●   | ●   |      | ■             |           |             |       |        | ●     | ●           |              | ■          | ●          |             | ■                     |                              |
| ■               |    |     |     |      | ■             |           | ●           | ●     | ●      |       |             | ●            |            |            | ●           | ●                     |                              |
| ■               |    | ●   | ●   |      | ■             |           |             |       |        | ●     | ●           |              |            |            |             |                       | ✓                            |
| ●               | ■  |     |     |      | ●             | ■         |             |       |        |       |             |              |            |            |             |                       |                              |
| ■               |    |     |     |      | ■             |           | ●           |       |        |       |             |              |            |            |             | ●                     |                              |
| ●               | ■  |     |     |      | ●             | ■         |             |       |        |       |             | ●            |            |            | ●           | ●                     |                              |
| ■               |    | ●   | ●   |      | ■             |           |             |       |        | ●     | ●           |              |            |            |             |                       | ✓                            |
|                 |    |     |     |      |               |           | ●           |       |        |       |             | ■            |            |            | ■           | ●                     |                              |
| ■               |    | ●   | ●   |      | ■             |           |             |       |        | ●     | ●           |              |            | ●          |             |                       |                              |

## The SMI Advantage is Yours

Today's consumers are educated and health conscious. They expect fortification when they select brands to keep themselves and their families healthy. SMI has extensive experience helping manufacturers meet the demands of the new marketplace.

Calcium fortification helps you survive in an increasingly competitive world. When you work with Specialty Minerals, the world's leading precipitated calcium carbonate (PCC) innovator, you gain critical competitive advantages.

No one else can bring the strength of invention, the capacity to partner effectively, or the power of proven performance that we deliver day in and day out. Whether you produce food, beverages, or nutritional products, Specialty Minerals can help you win market share with GCCs and PCCs like ViCALity® and CalEssence®.

We look forward to discussing how the SMI Advantage can work in your formulation.



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